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SCORE CHAOS IN HIGH-FREQUENCY PROCESSING FIELD

A full-page symposium on high-frequency electrical processing, appearing in the 29 October issue of Leningradskaya Pravda, affords an interesting picture of the confusion accompanying the introduction of a new technological process in Soviet industry. The general theme, repeated with variations by each of the four writers quoted below, is that the whole thing is a fine idea and that somebody should do something about it. The writers indicate that there is lack of high-level coordination of the field. One reports that plants, institutes, and laboratories operate independently, duplicating effort on every hand. Standardization of equipment is almost entirely lacking. The writers assign blame for the situation primarily to the Ministry of Electrical Industry and the Ministry of Communications Equipment Industry. These are characterized as "cuckoos laying eggs in other birds' nests," a Russian equivalent for passing the buck.⁷

V. Vologdin, Corresponding Member, Academy of Sciences USSR

The USSR has been the pioneer in the field of high-frequency processes. Because of the conservatism of some of the workers in the ministries, however, we have lost much time. Progress is further blocked by an incorrect and unscientific approach to the problem of applying such methods in industry. Many plants use improper frequencies and wrong types of generators. A number of arbitrary and false ideas about generators have seriously held up production despite the tremendous capacity of our electrical enterprises. Vacuum-tube generators and equipment for industrial processes are either not being made at all or are coming out in the most haphazard manner.

It is the true that there has been some action in the field recently. The Elektrik Plant has begun putting out a 100-kilowatt generator of sufficiently good quality. The Elektrosila Plant has likewise gone into production of more powerful generators. If these successes could be multiplied, hundreds of plants could have their own high-frequency equipment.

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The production of vacuum-tube generators for industrial use has unfortunately not received the attention it warrants. The shops which make them have neither the floor space nor the equipment to do the job properly. The personnel situation is no better.

It is obvious that no one in the Ministry of Electrical Industry or the Ministry of Communications Equipment Industry is willing to take the responsibility for putting this vital new technology into general use. Both these ministries, in their efforts to avoid the difficulties that accompany any new idea, remind one of a cuckoo laying its eggs in other birds' nests. How else can one account for the fact that the principal vacuum-tube generator plant is under the Ministry of Agricultural Machine Building?

The Ministry of Higher Education USSR is doing nothing to improve the personnel situation. While the Leningrad Electrical Engineering Institute graduates about 15 high-frequency engineers a year, several thousand high-frequency units are due to come out. Who is going to operate them?

On the other hand, the Scientific Research Institute of the Ministry of Automobile and Tractor Industry USSR has set up a special course for training high-frequency specialists. Before the end of 1949, about 100 skilled graduates of this course are to take their places in industry. It is unfortunate that only 45 percent of the men taking the course are engineers. The rest have inadequate basic technical training.

The entire research base in this field needs radical overhauling. A coordinated research program, coupled with intensified training of personnel, is the solution to this important national problem.

Chief Engineer, Elektrik Plant

What Leningrad industry has accomplished along the lines of high-frequency treatment of metals is only a drop in the bucket.

The main thing holding up expansion of such methods is the present inadequate output of high-frequency equipment. The explanation of this lies in the underestimation by certain people in the Ministry of Electrical Industry of the importance of high-frequency processing.

We of the Elektrik Plant have always been progressive in this field. We built the first generators for high-frequency smelting of metal. When recent experiments here showed that electric welding was more efficient with higher frequency feeds, we jumped into production of a new single-phase welding generator which puts out current at the new frequency.

Our plant, however, cannot possibly keep up with the demand for high-frequency equipment. We are a welding-equipment outfit and cannot go into a side line like high-frequency machines.

We believe that Leningrad should have a centralized base for the manufacture, assembly and development of high-frequency units. The Promelektropech' (Industrial Electric Furnace) Trust is endeavoring to do something of the kind now, but it simply does not have the facilities to do the job. Meanwhile, most plants build their own units and do their own development work, with the result that ultimate standardization becomes less and less possible. There is wasteful parallelism of effort and needless drain on state funds. All sorts of odd equipment is manufactured; there is no agreement on frequency or voltages of transformers, condensers, or generators.

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The only solution for this situation is the centralized research, development, and production base. The value of this huge contribution to the national economy may be lost if action is not taken to provide a strong leadership in this vital new field.

Laboratory Chief, High-Frequency Institute

The idea of industrial use of high-frequency currents was first worked out on the test stands of our institute. Here the nature of such currents, their possible uses, and the methods of their application were developed. We have always maintained close contact with the practical problems of Leningrad industries. So far, we have studied the high-frequency possibilities of 12 plants in this city.

Eight of the plants were found to have high-frequency equipment; we helped them get it into operation. In the other four we helped them set up the equipment and to get it working. This sort of help to industry is now taking place in Kuybyshev, Kuznets', Stalingrad, and a number of other cities.

One way that scientific organizations can help in the expansion of such methods is to get some literature on the subject into print. There is an urgent need for more and better trained personnel in the field.

Chief, Heat-Treatment Shop; laboratory engineer, Plant imeni Stalin

Induction annealing of metal by high-frequency current is finding extremely broad application in industry because of its technical and economic advantages over conventional annealing.

In the tool shop of the Plant imeni Stalin /heavy turbine and power-equipment builders/ we have a high-frequency unit which we use for annealing and melting metals. The vacuum-tube generator is anything but the latest design; we find, however, that we can do the widest variety of work with it.

In the last 6 months we have taken up soldering of long drills with high-speed steel; we braze hard blades on cutters, drills, countersink reamers, and milling cutters; we temper such minute parts of precision instruments as micrometer screws. We have found that pneumatic-punch bits last 2-2½ times as long if electrically tempered.

Plant laboratories still have a great deal of work ahead, however. We need much information of how various metals are affected by high-frequency currents. Too many plant laboratories in Leningrad fail to appreciate the significance of electric tempering.

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